Soybean trade telecouplings and land use change in Uruguay: connecting the provincial to the global

Abstract:

Achieving sustainable agriculture requires identifying the links between key actors’ behaviour and remote impacts (i.e. the “who”, the “what” and the “where”). However, efforts at assessment are constrained by a lack of connection between international trade flows, empirical outcomes within local systems, and the role of facilitating actors. A combination of the novel telecoupling framework with the newly-developed Spatially Explicit Information on Production Consumption Systems (SEI-PCS) model has potential to address these constraints. This study therefore used SEI-PCS to assess whether the emergence of soybean trade telecouplings drove land use change outcomes in Uruguayan provinces between 2000 and 2011, and identify which soybean traders facilitated any telecoupling. There was evidence that the emergence of a soybean trade telecoupling between the central Litoral provinces and China, via the soybean trading companies ADM, Dreyfus and Cargill, drove livestock and cropland conversion to soybean production in these provinces. Conversely, this telecoupling may have created a spillover system in the North due to displacement of beef production. This shows that there can be important subnational spatial heterogeneity in agricultural land use change outcomes driven by remote consumption. Further work is proposed to clarify the key factors responsible for these differences in outcome, and their implications for future sustainability for agricultural production in Uruguay.